

## **BIO 103-001: GENERAL BIOLOGY I**

FALL 2009: TWF 10:30-11:20 AM

Room: Albertus Magnus 137

Credit Hours: 4.00



PROVIDENCE  
COLLEGE

### INSTRUCTOR:

Name: Rev. Nicanor Pier Giorgio Austriaco, O.P., Ph.D., S.T.L.

Office: Sowa Hall 229B

Laboratory: Hickey Labs 181

Phone: 401-865-1823 (office)  
401-865-1620 (laboratory)  
401-865-1906 (personal)

Email: [naustria@providence.edu](mailto:naustria@providence.edu)

I am generally in my office (Sowa 229B) or in my laboratory (Hickey Labs 181) from 9:00 AM - 5:00 PM daily and am easily available with a prior appointment. To make an appointment, call me at 865-1823. You may also contact me via email. I will keep Wednesday afternoons from 2:00 PM to 5:00 PM for drop-in appointments. Come look for me in my office or in my lab. Please feel free to talk to me about any issue relating either to the course or to your life as a student here at Providence College.

### PEER STUDY GROUP LEADERS:

This course has four attached peer study group leaders associated with the Tutoring Center of the Office of Academic Services located on the second floor of the Phillips Memorial Library.

Trisha Osmolak '10

[posmolak@providence.edu](mailto:posmolak@providence.edu)

John Butler '11

[jbutle11@providence.edu](mailto:jbutle11@providence.edu)

Joanna Scimeca '11

[jscimeca@providence.edu](mailto:jscimeca@providence.edu)

Daniel Kowalski '12

[dkowalsk@providence.edu](mailto:dkowalsk@providence.edu)

We will be scheduling weekly study group sessions led by these students to provide additional intellectual support for this course. You may also schedule one-on-one tutoring sessions with our peer study group leaders by signing up for appointments at the Office of Academic Services.

#### **A PRAYER BEFORE STUDY**

**St. Thomas Aquinas, O.P.**

**O God, Creator of all things, true source of light and wisdom, graciously let a ray of your light penetrate the darkness of my understanding. Give me a keen intellect, a retentive memory, and the ability to grasp things correctly and fundamentally. Give me the talent of being exact in my explanations and the ability to express myself with thoroughness and charm. Point out the beginning, direct the progress, and perfect my work. We ask you this through Jesus Christ Our Lord. Amen.**

## COURSE DESCRIPTION:

This course is the first-semester course of an introductory survey of the biological sciences for undergraduates majoring in biology. The sequence of material covered moves from lower to higher levels of biological organization, beginning with the cellular and organismic levels and terminating with the population and community levels.

This semester, we will cover molecular biology, cellular biology, and genetics. In addition to covering the basic vocabulary of modern molecular biology, the course will focus on critical thinking about experimental science. This will include experimental methodologies, experimental design, and data interpretation. Conventional lecture material will be supplemented with analyses of primary scientific literature. The overall goal of this course is for students to obtain a rigorous scientific foundation that will leave them well prepared for subsequent course work.

## REQUIRED TEXTS:

- Scott Freeman, *Biological Science*, 3<sup>rd</sup> edn. (Upper Saddle River, NJ: Prentice Hall, 2008).
- Papers from the primary scientific literature will be posted on the class ANGEL website.

## ACADEMIC EXPECTATIONS:

Grades will be calculated as follows:

Midterm Examinations	36% (12% each)
Final Examination	20%
Critical Thinking Exercises	14%
Laboratory	30%
	-----
	100%

Note that you may replace one of your midterm examination grades with your grade on the comprehensive final exam.

Academic dishonesty, cheating, and plagiarism (“the stealing and passing off of the ideas or words of another as one’s own without crediting the source”) are not tolerated in the professional world of scientific and medical research and will not be tolerated in this class. For the first offense, the student will receive a zero for the examination or the assignment. If a student aids another student during the exam, both parties will receive a zero. For the second offense, the student will receive an F for the course. Please consult the current Providence College Undergraduate Catalog for its statement on “Academic Honesty.”

## CRITICAL THINKING EXERCISES:

During the course of the semester, ten critical thinking exercises will be assigned on the indicated dates in the syllabus below. Seven of these exercises highlight the key concepts for many of the important topics of the course and will serve as excellent preparation for the

examinations. These exercises will be posted to ANGEL. Three of these assignments will involve two research seminar reports and a poster session report.

**CRITICAL THINKING EXERCISES:** Each exercise will be an open-book assignment. In other words, you are free to consult any textbooks, reviews, or scientific papers. However, if you do so, please reference your sources and note them in your response. You may also discuss your responses with your classmates and with your peer study group leader. However, I expect the responses to be written independently. Furthermore, if you do discuss your responses with your classmates, please note this on your exam and list the names of your collaborators.

Please submit your typed responses to the DROPBOX found on ANGEL. These exercises are due on the dates indicated below. These assignments will be graded on a pass/fail basis. Responses that manifest reasonable effort on the part of the student will be graded as a pass and receive full credit for that assignment.

**RESEARCH SEMINAR REPORTS:** The Department of Biology at Providence College hosts regular department research seminars during the course of the semester. Flyers announcing these seminars will be posted in Albertus Magnus and in Sowa. Each student will be required to attend at least two research seminars during the semester and to submit a report on the seminar. In a 25-50 word paragraph, please describe the seminar responding to the following questions: (1) Why did the scientist do the experiments described in his or her research seminar? (2) What was the most important research finding described in the seminar? (3) Did you find the research data convincing? Why or why not? Please submit your typed research seminar reports to the DROPBOX found on ANGEL. It is due within 24 hours of the seminar.

**POSTER SESSION REPORT:** The Sigma Xi National Research Honor Society Chapter at Providence College will be hosting the annual Sigma Xi Undergraduate Research Poster Session on Saturday, October 24, 2009, in the Hickey Laboratories. Each student will be required to attend the poster session and to submit a report on one poster presented at that session. In a 25-50 word paragraph, please describe one poster responding to the following questions: (1) Why did the research student do the experiments described in his or her poster? (2) What was the most important figure on that poster? Why was it the most important figure? (3) Did you find the research data convincing? Why or why not? Please submit your typed poster session report to the DROPBOX found on ANGEL. It is due on Monday, October 26, 2009, at 6 PM.

In the world of science, grants have to be submitted to the funding agency by a particular deadline. There are no exceptions to this rule. Thus, in this class, I expect all work to be handed in on time. Late assignments will be penalized 10% of their point value per calendar day late (not per class day).

CLASSROOM POLICIES:

- Students will be assigned their seats in Albertus Magnus 137. Please pick the seat of your choice by the second-class meeting.
- Cell phone use – including texting – is not permitted in class. Cell phones used in class will be confiscated and returned to the student at the next class meeting.
- If you would like to use your laptop computer in class, please ask the instructor for permission. Permission will only be given when use of the computer is essential for note-taking purposes.
- Clickers will be used on a regular basis in this course. Please be sure to bring your clicker to every class meeting. Clickers will be distributed during the first meeting of the course. PLEASE DO NOT MISPLACE YOUR CLICKER. THE REPLACEMENT COST FOR EACH CLICKER IS \$100.00. Please contact Siobhan Ross-Humphries at the Instructional Technology Development Program (ITDP) [Feinstein 305] for more information: [srosshum@providence.edu](mailto:srosshum@providence.edu).

## SYLLABUS OF TOPICS AND READINGS

Date	Topic	Chapter	Assignment or Special Topic	Lab
9/8	Introduction			1
9/9	The Science of Biology	1	<i>Fei et al., Overview</i> Exercise 1 – Experimental Design	
9/11	Cell Structure & Function	7	<i>Fei et al., Figure 1</i>	
9/15	Nucleic Acids	4	<i>Fei et al., Figure 2</i>	2
9/16	DNA Synthesis	14	Exercise 1 DUE Exercise 2 – DNA Structure	
9/18				
9/22	PCR and Electrophoresis	19		3
9/23	Gene Function: Central Dogma	15	Exercise 2 DUE	
9/25	<b>EXAM I</b>			
9/29	Protein Structure and Function	3	<i>Fei et al., Figure 4</i> Exercise 3 – Mutations	4
9/30				
10/2	RNA and Protein Synthesis	16		
10/6			Exercise 3 DUE	5
10/7	Protein Trafficking	7		
10/9	Genomics: The Human Genome	20	Exercise 4 – PCR and Gel Electrophoresis	
10/13	MONDAY SCHEDULE NO CLASS			
10/14	Cell-cell Interactions	8		Practical
10/16	<b>EXAM II</b>			
10/20	Gene Expression: Prokaryotes	17	Exercise 4 DUE	6
10/21			<i>Fei et al., Figure 2</i>	
10/23	Gene Expression: Eukaryotes	18		
10/27	Lipids and Membranes	6	<i>Fei et al., Figure 3</i>	7
10/28				
10/30	Cell Cycle: Mitosis	11	Exercise 5 – Cell Cycle Regulation	
11/3				8
11/4	Cell Cycle: Meiosis	12	Exercise 5 DUE	
11/6				
11/10	Classical Genetics	13	Exercise 6 – Mendelian Inheritance	9
11/11				
11/13	Carbohydrates	5	Exercise 6 DUE	10
11/17	<b>EXAM III</b>			

11/18	Cellular Respiration	9	Exercise 7 – Respiration and Photosynthesis	
11/20				
11/24	Photosynthesis	10		
11/25	THANKSGIVING NO CLASS			
11/27	THANKSGIVING NO CLASS			
12/1			Exercise 7 DUE	Practical
12/2	Special Topics in Biology			
12/4	CONFERENCE NO CLASS			
12/8	Special Topics in Biology			
12/9	Special Topics in Biology			
12/11	Special Topics in Biology			
12/18	<b>COMPREHENSIVE FINAL EXAM</b>			